Saint Paul Public Schools
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Imaging OS X with NetRestore

Revised April 2007 by Nathaniel Lindley

You can set up a bunch of machines using OS X in 3 simple steps.

Step 1. Prepare your "model" system
Step 2. Make an image from "model" system
Step 3. Clone to other machines and individualize

Tools Needed:

Model machine: This should be a computer of the same type that you plan to clone to. iMac to iMac, iBook to iBook. etc. Generally a newer machine will clone onto an older machine but not vice versa.

District Base image: It's best to start from our district base image. You'll also need any school specific application software and printer addresses and types.

FireWire Hard drive: An external Hard Drive that can either boot the machine or that can store the image if you have a second machine.

Time: This is initially a slow process to set up and configure and test. However, after that, setting up a new machine is fast! I think it takes about a day to set up, configure and test a "model" system and then another day to install on 30 lab machines via Firewire drive. It is faster as you get more comfortable and if you can use a NetBoot Server.

Software:

NetRestore and NetRestore Helper http://www.bombich.com
External Firewire Drive
Operating System Install CD's
Application Install software

This document can be found at: http://connect.spps.org/techworks.html
Other documents and resources can be found at:
http://ramsey.spps.org/techworks.html password: tech

Step 1. Prepare your "model" system

Easiest way to start is to begin with a district base image. You'll save time because some accounts and settings are already there and you'll only need to add some school specific applications, accounts and printers.

or the long way:

Start by formatting your hard drive on the model machine that you plan to use to clone to other machines of similar type. Don't create an image on an iMac to clone to an iBook. Generally stay in the same generation for each machine. Clamshell ibook images are different from white ibooks. A G4 image will not work on a G5 computer.

Install the Operating Systems from the original CD's that came with the machine if possible. Some models have hardware specific builds that won't work with retail install CD/DVDs. (This is true for new iBooks which have different track-pad hardware). Update each operating system before installing your applications or changing the settings. I always use the "Combo" updates rather than the single .X updates. Download them from Apple's Support website: http://www.apple.com/support/downloads/

Install Applications for OS 9 (Optional-Won't work on Intel based machines)

If you have any OS 9 applications, your original Install CD/DVD should have placed some basic OS 9 folders on your hard drive. "System Folder, Applications Mac OS 9) I would consolidate the Applications Mac OS 9 folder. Put most of the junk either in the Apple Extras or Utilities folder. Get rid of things you don't want like Outlook Express and iTunes, Netscape 4.
Put your OS 9 Applications on the computer and run them at least once to make sure the work for a local user.
Current versions: Internet Explorer 5.1.7, Appleworks 6.2.5/7, Quicktime 6.4, Adobe Acrobat Reader 5.1, Startup Control Panel 9.2.6

Configure OS 9

You shouldn't have to configure much in OS 9 anymore. System Preferences in OS X should take care of most of it. It depends on your software which you know better than I.

Check other Control Panel settings that you may want to specify. Depending on your intended users you may want to turn off cascading menus, or recent applications, documents and servers in the **Apple Menu Options** control panel

Extensions Manager. Here you can disable items that you won't need and save memory. When you open it choose "as Packages" from the View Menu. I uncheck:

Apple Remote Access
English Speech Recognition
English Text-to-Speech
FaxSTF
FBC Indexing scheduler
Find by Content
Voice Verification
Personal Web Sharing
USB Printer Sharing/Extension

You many want to enable some of these or disable others. It' trial and error if you don't know what they do. **TEST FIRST**--one item at a time if needed.

Install Applications for OS X

I recommend having *only* the OS X version of Lotus Notes and Microsoft Office rather than both versions. Or you can install the classic version of each, but not both.
Install other applications as the administrator.

**** Setting up **Lotus Notes 6.5.4** for OS X is more complicated, see other install instructions if needed.

You may want to download and install the following OS X apps. Watch for versions though. Some work on 10.3 but not 10.4 etc.

Safari Enhancer..... http://www.macupdate.com/info.php/id/10482
PDF Plugin..... http://www.schubert-it.com/
DeLocalizer..... http://www.bombich.com/software/local.html
Print Center Repair.....http://www.fixamac.net/software/pcr/
Onyx.....http://www.macupdate.com/info.php/id/11582
Applejack.....http://www.macupdate.com/info.php/id/15687
Whatsize..... http://www.macupdate.com/info.php/id/13006
Firefox..... http://www.mozilla.org/products/firefox/
Anacron.....http://macupdate.com/info.php/id/18162
AppleJack..... http://www.macupdate.com/info.php/id/15667
More Internet..... http://www.macupdate.com/info.php/id/12849
For Laptops
MacStumbler..... http://www.macupdate.com/info.php/id/8035
Coconut Battery.....http://www.macupdate.com/info.php/id/19085

Check for current versions of applications by running Software Update
Appleworks 6.2.9, Office 2004 has its own software update.
Adobe has released Acrobat 8 for OS X but this still only provides a browser plugin for Safari and 10.3.X and 10.4.X I like to use the Schubert PDF-Plugin (PPC only - not Intel) on 10.3 and up because it will work with all browsers except Internet Explorer.
FireFox is a browser from Mozilla.com that runs on PC, Mac and Linux. It is supposed to be compatible with Campus and works well with the PDF forms that are used.

You may also want to remove applications that won't be used. Garageband, WorldBook and iDVD are huge programs with a lot of Application Support files. Use *WhatSize* to find out where your bulk of hard drive space is being used. I remove Mail, iChat, FaxSTF, Quicken, Games, etc. (when a new user is created on the machine, they may have question marks in the dock for the missing applications, just push the question mark off)

Configuring OS X

After installing OS X, the setup assistant will run. The first user name is the machine Admin. Set this as "Administrator" and admin for the machine. Use a good password. You'll also want to set up a 2nd administrator account either as a backup or the main one you use. I use the school name. This allows a "back door" if you forget the other password or someone changes the first. I also change the desktop wallpaper for each user so I can tell quickly who I am logged in as.

<u>System Preferences</u>
CD & DVD: choose what you want to happen when you insert a blank or recorded Media
Energy Saver: Set when you want the screen to dim and system go to sleep. In Panther 10.3 and up you can also set an automatic shut-down time under the Schedule tab. This only works if a user is logged in and the computer is not asleep.
Network: Open Network Port Configurations, move Ethernet to the top, then Airport then Modem. This is the order that the computer will look for a connection. (you can uncheck modem if you'll never use it.) Make sure TCP/IP is set to DHCP, Appletalk is on and no Proxie is set.
Quicktime: set connection speed to 256 Kbps.
Remote Desktop: If you plan to use it and have it installed, set a school administrator to full access of the machine. Set to start at system startup. If you use ARD 3, make sure to update the ARD client software.
Sharing: Set Computer name and Rendezvous name to something generic as this will be reset to each individual computer later after cloning. The district standard is now the 2nd IP octet followed by a dash and room number or

user and then the property control number then your choice. For Example: "22-Lab207-17-223994E"

Accounts: If you need more accounts, add them here. Example, Staff, student, admin. This greatly depends on your usage. I recommend making a school specific admin account, such as "ramsey admin" to use instead of always using bldgtech. Note: For Apple Remote Desktop 2 your user account must have a shortname of 8 characters or less.

Classic: If you plan to use Classic every time you use the computer, check "start classic when you log in" to simplify. You want to check "use preferences from home folder" if you will be using classic apps. This setting is sometimes flaky, so be sure to test it some before distributing. Set Classic to sleep if it is inactive to "never". This will prevent delays when you use classic apps. Make sure you designate your Classic System Folder and start it at least once so OS X can update the classic settings. The first time a user starts up classic they will be asked to copy or leave folders, I always choose "Copy Folders."

Date & Time: check date and time, use Network Time settings to be accurate.

Software Update: Uncheck the box "Automatically check for updates when you have a network connection" for you as admin and for user

Set all preferences and settings and TEST, TEST, TEST

It is important to set the machine up in a generic way. Test the programs as the administrator *and* as the user to make sure the work for both a local administrator and a local restricted user (if that is what you want.) Check to see that the user can print and save documents, then throw them away. You don't need documents (unless you want some) but will want to run every program and make sure they work. If you start with all users being admins and then changing them to non-admins, it is important to make sure they can still do what you want them to be able to do. DVD player requires an admin to choose the region code the first time it launches.

If you are using network accounts, login as a dummy network user and test the applications and saving, too. You can set the binding in Directory Access, but don't use "authenticated binding"

Set up a printer if that will be the same for each user on that machine. Print from some applications to make sure that works. I've had some problems printing to IP printers from Classic, so those may need to be done with Appletalk, but otherwise, use IP printing and Rendezvous/Bonjour. *Note:* Appletalk doesn't work well with wireless network connections.

If you are installing Lotus Notes Client, **don't** run the configuration and setup until <u>after</u> the cloning and you have the user ID file and address book. I make

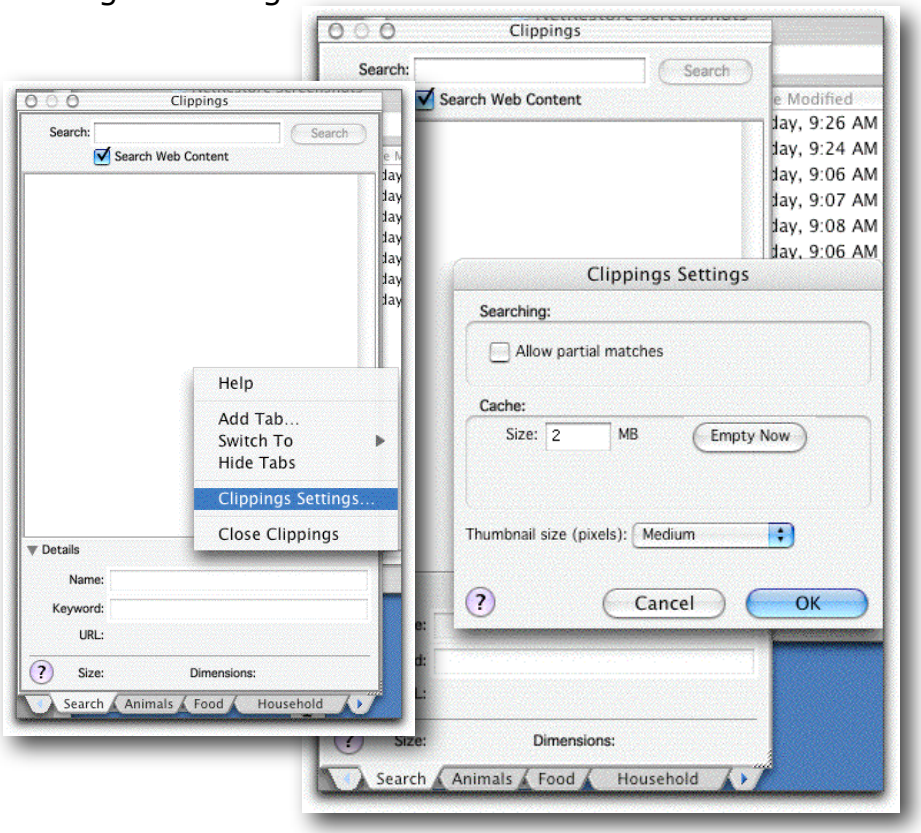
a Stuffit or ZIP Archive of the default "Data" folder so that I can copy it to a home directory later on if needed. See the Lotus Notes OS X install document for more help.

In **Internet Explorer**, set preferences *as each user* to the following:

Delete all generic default Favorites, add your own if needed
Set the home page to something useful
Disable Auto fill
Set Cache to update once per session
Change cache size to 2 MB
In Security uncheck the top three alert items
Under Protocol helpers select mailto: to use Lotus Notes as the application for the teacher/staff account.
Delete all cookies
Set Download location to Desktop if it is not already

Create a folder at the root level of the hard drive as "Staff_Local" or "Shared_Local" or "Local_Folder" or whatever and set ownership and permissions to Read&Write for everyone. Just make sure every machine has a folder like it with the same name. This prevents confusion later on.

In **Appleworks** change the clipping cache size to 2 MB.
File >> Show Clippings. Control+Click in the window and choose Clipping Settings. Change cache size to 2 MB.



In Appleworks Preferences, General, Text tab, check Fractional Character Widths. Files Tab, uncheck, Old version alert and add (v6.0)suffix, **Uncheck** Auto-Save and Remember last 10 documents.
Other settings can be changed by the user if desired.

Office: Open a new document in each application and save a sample and make sure to check the box "append file extension" as the user of the machine. This will help the transfer of documents to PC's and with e-mail.

Make sure "Always show file extensions" is checked in Finder Preferences. Office installs so many Fonts that I move the user fonts from the Admin's user folder to the computer's Library folder. This prevents the fonts from being installed for each user. I do this before creating other accounts.
Move fonts from `~/Library/Fonts` to `/Library/Fonts`

When you finish testing everything, clear out your tracks. You can run Onyx or Applejack to clear out caches and history.

PDF-Plugin (PPC only - Not Intel)
The Schubert Plug-in is a free for educational user plugin that allows *some* browsers to open PDF files in the browser rather than downloading to desktop. We are using the 2.2.X version with OS X 10.3 and up and Campus. It works well with Firefox and Safari. It does not work with Internet Explorer 5.2.3.
The developer made a beta plugin to work with IE which is no longer available at his website. I have put it up on my website:
http://ramsey.spps.org/techworks.html
This IE plugin needs to be installed *inside* the IE package rather than in the /Library/Internet Plug-Ins folder. His instructions come with it.
The 2.1 or 2.2 PDF Plug-In can be installed in the /Library/Internet Plug-ins folder by an admin of the machine and that will allow it to work for all users of the computer.
Users of 10.2.8 should see that they have a different plugin to use than users of 10.3. and 10.4.x

Special Education teachers have a more complex setup with the PDF-Plugin and Acrobat Reader that allows them to enter data into PDF forms (FDF).

Firefox Settings
Firefox is now the recommended browser of choice for Campus on OS X and Urban Planet). You will need to change a few settings for *each user* to make things work better in Campus. This means changes you make for the admin

don’t change the settings for other users. The first time you open Firefox it takes a while to launch as it configures settings and preferences for the first time.

Go the Firefox >> Preferences menu. At the General tab, set the homepage to http://connect.spps.org Under the Privacy Tab, Uncheck the box for Saved Form Information, Uncheck the box for Saved passwords, Check the box for Cookies “for the originating website only” and Under the Cache tab, change the amount to 50 or 500 KB instead of 50000 KB. The other settings can be left alone.

You will also want to test Firefox with different web elements. Make sure that quicktime files work, Shockwave, flash, mp3s, PDFs, etc. If you are able to, test opening the Campus Gradebook and check the “Grant Always” security warning.

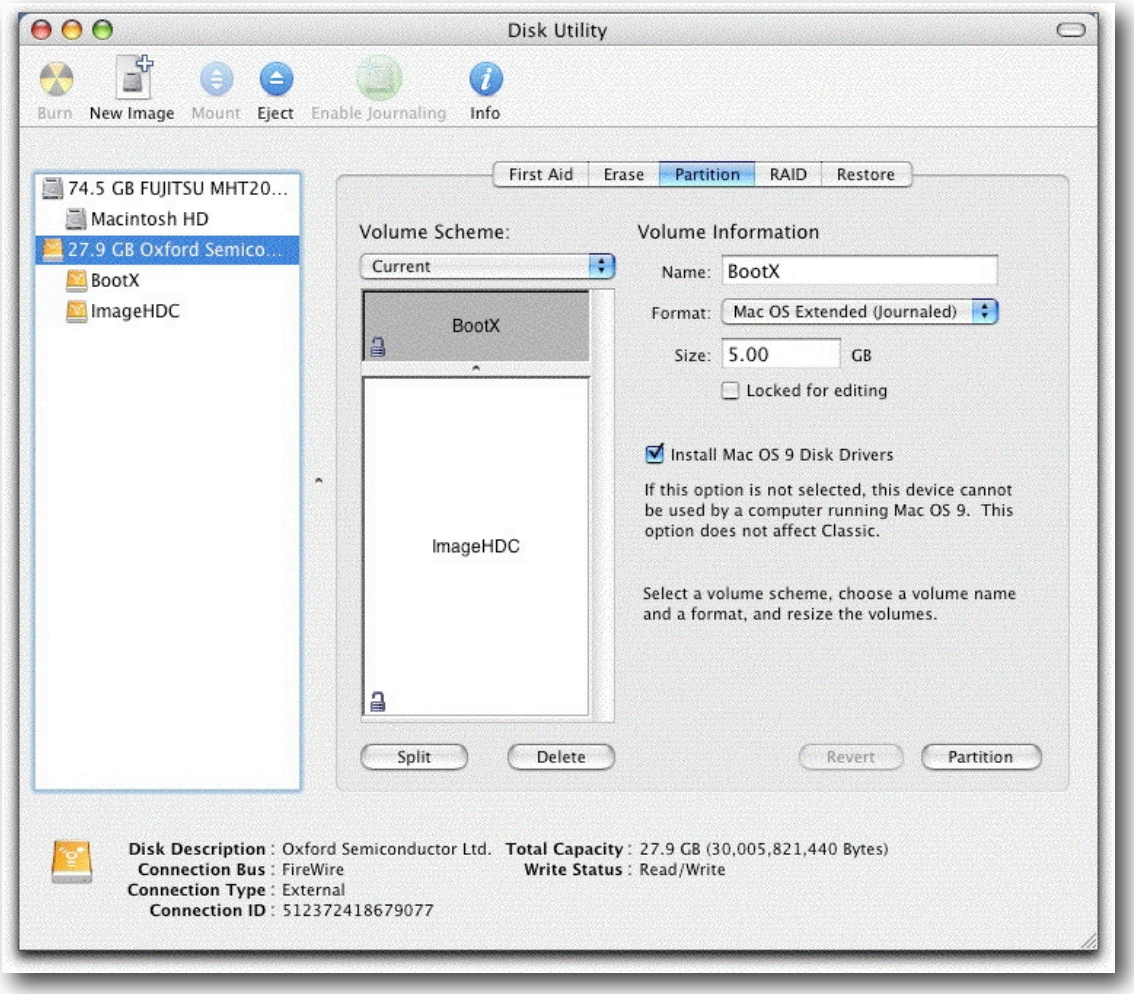
Last Steps before Imaging

Before you boot to a firewire drive and run the NetRestore process, be sure to run the Utilities like Applejack and DeLocalizer to clean up all the changes you made. I also run Repair Permissions from Disk Utility.

Step 2. Make an image of "model" machine

The process here is simple. You've done all the hard work already. Basically, you'll partition a firewire hard drive into two partitions, boot to one, run NetRestore Helper, make a disc image and save it onto the second partition.

Set up your firewire hard drive:



Plug the drive into you computer and open up **Disk Utility**. Click on your External hard drive on the left, the click the Partition Tab. Choose 2 partitions under Volume Scheme. I make one small one of 5 GB and name it BootX, I then make the second partition as big as possible and name it something else. Format should be Mac OS Extended.

Install OS X on the small Boot partition. You can do this from the CD/DVD from the model computer. You won't need all the extra applications for this. I highly recommend that you name the admin for this boot partition as "admin" with a password of "admin" for simplification.

Update the OS. You need **10.3 Panther** to run NetRestore 2.x and **10.4 Tiger** to run NetRestore version 3.3.x. You can image 10.3 and 10.4 computers using NetRestore 3.3.x from a 10.4 Boot drive. You won't need OS 9 or clas-

sic unless you want to use ASR for OS 9, too. That's another paper. You want to set the Energy Saver preferences on the Boot partition to not sleep at all.

Install the three main applications onto the boot partition on the external drive for cloning. Net Restore (2.x or 3.3.x) and DeLocalizer (1.1) from Mike Bombich's website, http://www.bombich.com These are all free. There are a lot of good articles there, too. These are to be installed on the Boot partition of your Firewire Hard drive. I also add these to the dock.

To boot to the external hard drive, either open the Startup Disk System Preference and choose it there and restart, or restart and hold down the option key to choose what system you want to boot to.
When booted to the External hard drive, change your desktop wallpaper to something different to remind you which drive you are booted to.

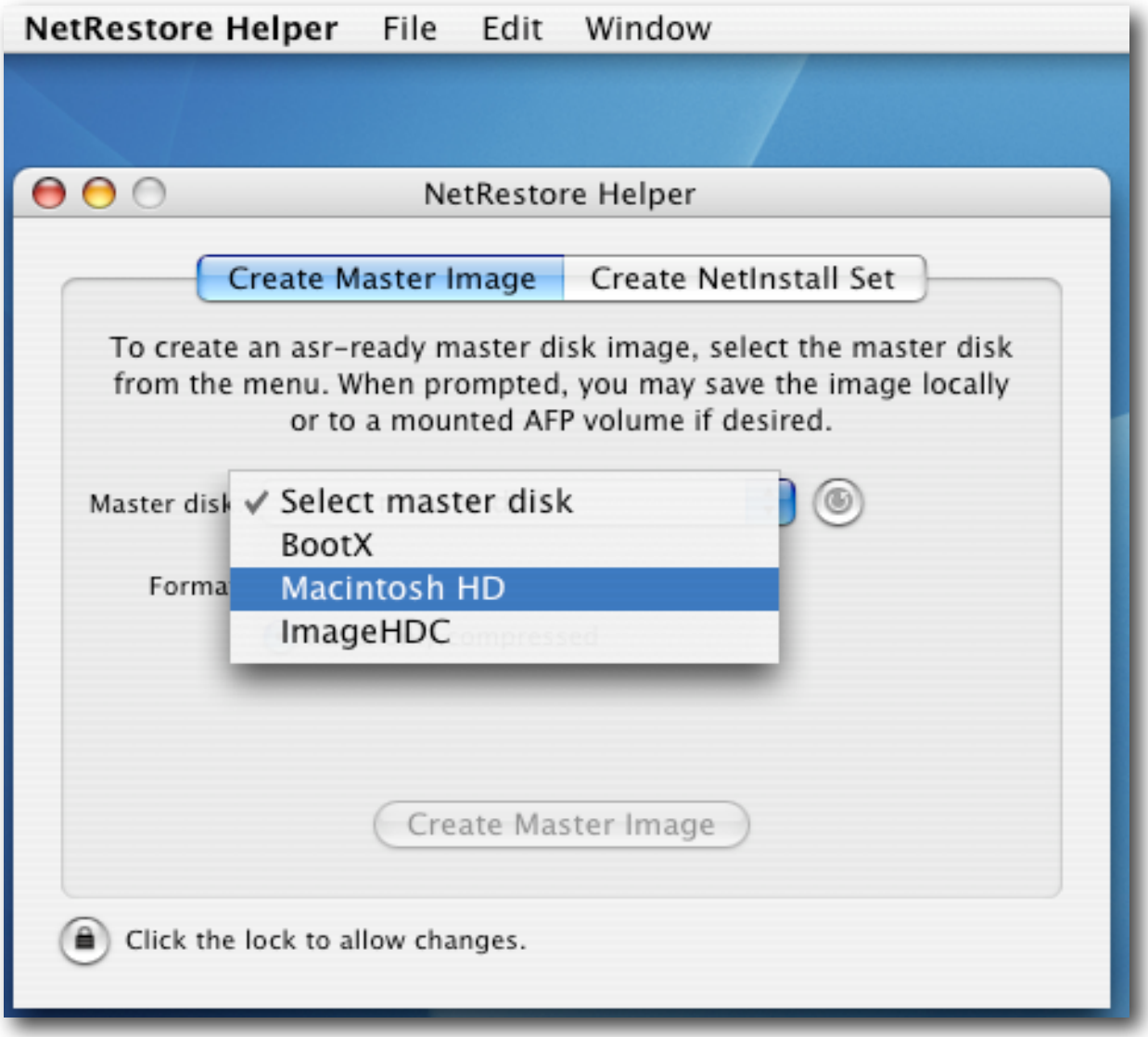
Run DeLocalizer on the computer's Hard drive to remove other language files, this can save a lot of space if all were installed originally.

Running NetRestore Helper to create image file.

Boot to External hard drive

Open NetRestore Helper, click on lock to authenticate with admin password.

Choose the *Internal* Computer Hard drive in the drop down list for Master Disk that you want to make and image from.


NetRestore Helper File Edit Window
NetRestore Helper
Create Master Image
Create NetInstall Set
To create an asr-ready master disk image, select the master disk from the menu. When prompted, you may save the image locally or to a mounted AFP volume if desired.
Master disk
Select master disk
BootX
Macintosh HD
ImageHDC
Forma
Create Master Image
Click the lock to allow changes.

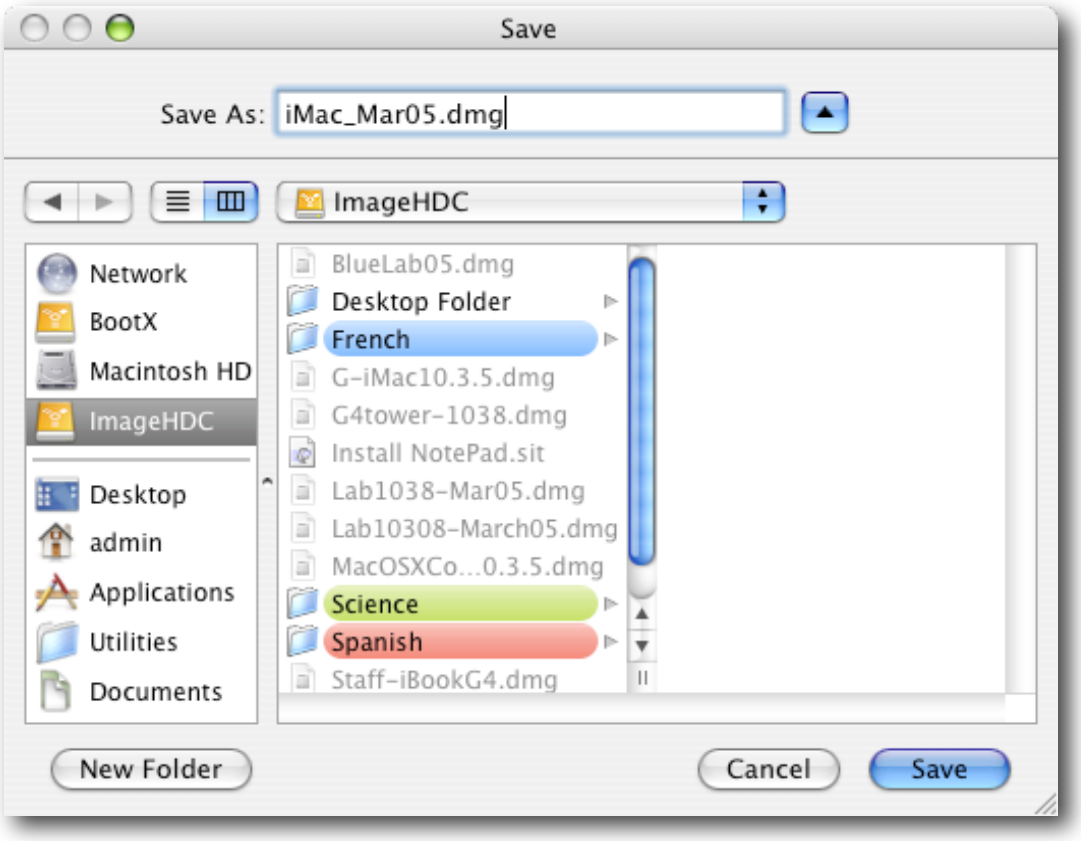
Leave “Read-Only compressed” checked.
Version 3.3.x. Check “Skip file-level restore checksumming”, Check “Skip multicast restore post-processing”

Click the Create Master Image button

(This picture is from Version 2.x)

NetRestore Helper
Create Master Image
Create NetInstall Set
To create an asr-ready master disk image, select the master disk from the menu. When prompted, you may save the image locally or to a mounted AFP volume if desired.
Master disk:
Macintosh HD
Format:
Read-only
Read-only compressed
Create Master Image
Click the lock to allow changes.

In the dialog, choose your storage partition and give the image a name. Example, “iMac-Mar05.dmg” Click Save.



It will then do all the rest of the work and save the file on the second partition of your firewire drive.

I cloned a 4.5 GB hard drive from an eMac to a plugged in FW drive in 1 hour including repair permissions. It compressed down to 2.6 GB.

Step 3. Clone to other machines and individualize.

Running Net Restore on a new machine

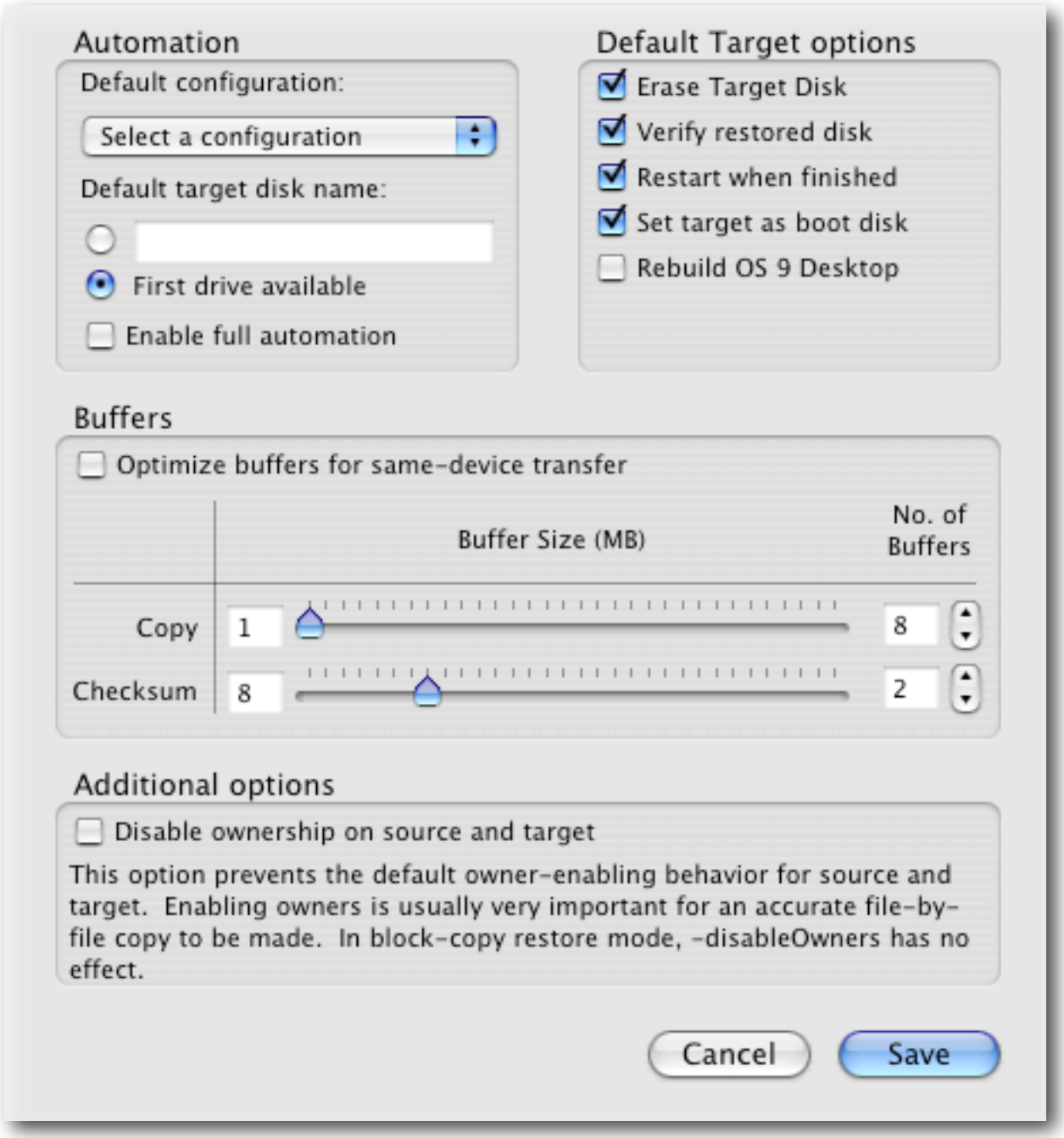
Boot new machine to **External drive.**

Net Restore 2.x or 3.x needs to be in its own folder called “NetRestore” in the Applications folder.
Open Net Restore, verify with admin password

At Source: Browse to find image file or drag it from the storage partition.

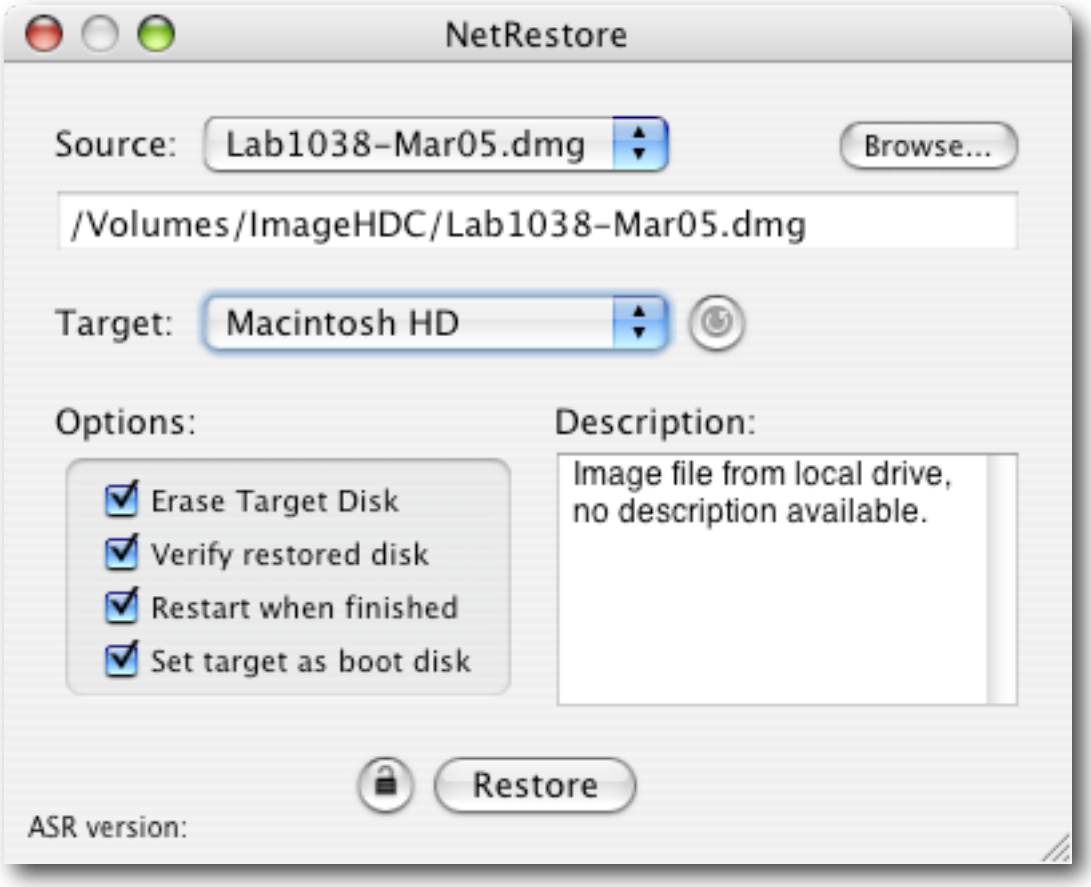
Under **NetRestore** menu, choose Edit configurations
Choose your image file in right configurations pane
Make sure local is checked
Add a description with the date you made the image
Set name of configuration if you want
click **Save**

NetRestore >> Preferences
Check "First drive available"
Default Target Disk Options: check all (OS 9 if you use it)
Save.



Select Target: Macintosh HD

1. Check "Erase Target Disk"
2. Check "Verify Restore Disk"
3. Uncheck "Restart when finished" or check if you like
4. Check "Set Target as Boot disk"



Optional:

NetRestore >> Post-Restore Actions

Check "Set computers hostname to:_____" add your computer name, either generic or individual. This is done each time you run NetRestore and isn't saved between sessions.

Click **Restore**

I restored an 2.8 GB compressed image onto an eMac in less than 11 minutes from a plugged in firewire drive.

I restored a 2.6 GB compressed image onto an iMac from a bus powered fire-wire drive in 12 minutes.

Individualize the new machines.

After restart login as administrator,
Go to **System Preferences**, click on **Sharing** tab. Check and/or change machine name and rendezvous name.

Set up printers if needed.

Run **Recon**. Specify Asset Tag, Location, Room, Remote Servers.

Set preferences and settings for other programs if needed (Lotus Notes 6)

Log out,
Login as user and verify settings and such.
Shut down.

You're done!

Extra Notes:

Beware when working mixing Intel based and PPC based images. They each use a different partition table scheme and can't be restored to the other type of computer. Label your images clearly with type.
You'll most likely need two separate Firewire drives for each type of machines because you can't boot a PPC Mac to a Intel based FW drive and visa versa.
Another option I've been using more and more when creating images is to boot the Model computer using Target Disk mode to another host computer (faster the better!) and image from that host computer. The host can be Intel or PPC and the model can be either since it is only looking at the drive as a whole and not as a bootable partition. This method gives you more speed because the internal drive of your host machine is faster than your FW drive. Once the image is saved to that Host hard drive, you can copy it to your FW drive or to the server.
When imaging one computer at a time, you'll need the Firewire drive with the two partitions to boot the target computer from. OR if you have another computer (like a laptop) you could again boot the target computer in Target Disk Mode to the host computer (your laptop with the image file) and then image from your host to the target. Make sure that the hard drive volumes are not both "Macintosh HD" as this will get confusing. I'd recommend that you change the name of your host (laptop) computer.

Host: the computer that you are using to create or restore the image from (laptop, FW drive, NetBoot Server)
Target: the computer that you are restoring the image made to
Model: the computer that you are creating an image from to deploy to other computers.